Hospital admission trends for bronchiolitis in Scotland, 2001-2016:

Hospital admission trends for bronchiolitis in Scotland, 2001-2016: a national retrospective observational study

Alexandria Chung[1], Rachel M Reeves[1], Harish Nair[1], Harry Campbell[1], for RESCEU investigators

1 Centre for Global Health, Usher Institute, University of Edinburgh, Edinburgh UK

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Abstract

Bronchiolitis is the commonest cause of respiratory related hospital admissions in young children. This study aimed to describe temporal trends in bronchiolitis admissions for children under 2 years of age in Scotland by patient characteristics, socioeconomic deprivation and duration of admission.

The national hospital admissions database for Scotland (SMR01) was used to extract data on all bronchiolitis admissions (ICD-10 code J21) in children under 2 years of age from 2001 to 2016. Deprivation quintiles was classified using the 2011 Scottish Index of Multiple Deprivation (SIMD).

Over the 15-year study period, admission rates for children under 2 years old increased 2.20-fold (95% CI 1.4-3.6) from 17.2 (95% CI 15.9-18.5) to 37.7 (95% CI 37.4-38.1) admission per 1,000 children per year. Admissions peaked in infants aged 1 month, and in those born in the three months preceding the peak bronchiolitis month – September, October, and November. Admissions from the

most deprived quintile had the highest overall rate of admission at 40.5 per 1,000 children per year (95% CI 39.5-41.5) compared with the least deprived quintile at 23.0 admissions per 1,000 children per year (95% CI 22.1-23.9). The most deprived quintile had the greatest increase in admissions over time, whilst the least deprived quintile had the lowest increase in admissions over time. Zero-day admissions, defined as admission and discharge within the same calendar date, increased 5.3-fold (95% CI 5.1-5.5) over the study period, with the highest increase in patients in the most deprived quintile.

This study provides baseline epidemiological data to aid policy makers in the strategic planning of preventative interventions. With the majority of bronchiolitis caused by Respiratory Syncytial Virus (RSV), and several RSV vaccines and monoclonal antibodies currently in clinical trials, understanding national trends in bronchiolitis admissions is an important proxy for determining potential RSV vaccination strategies.

Key words: bronchiolitis, infants, acute respiratory infection, hospital admissions, respiratory virus

Introduction

Bronchiolitis is the most common cause of respiratory related hospital admissions for children under 2 years old with a prospective study in England suggesting 3.7% of infants are admitted within their first year of life [1-5]. In the United Kingdom, several trends in bronchiolitis admissions in England have been described [2, 4, 6]. Firstly, infants under 6 months of age are the most vulnerable to bronchiolitis and have the highest risk of severe disease leading to admission [1, 7]. Secondly, children born just before or during the winter season are at a higher risk of being admitted for bronchiolitis compared to children born in the summer and spring months [1, 8]. Thirdly, the rate of bronchiolitis admission for infants under 1 year old was estimated have to increase by an average of 1.8% per year between 2004 and 2011 with suggestions of an accelerated increase of 5.2% per year between 2011 to 2016 [2, 5]. Finally, studies suggest children from lower socioeconomic groups

have a 30-37% higher risk for both standard hospitalisations due to acute lower respiratory tract infections and PICU admission due to bronchiolitis [6, 9, 10]. However, bronchiolitis admissions in Scotland have not been described in such detail [10, 11].

Respiratory syncytial virus (RSV) is a major cause of bronchiolitis. In England, it has been estimated that RSV is the cause of approximately 78% (95% CI 75-83%) of bronchiolitis admissions in children under 5 years of age [1, 10]. Although much of the severe bronchiolitis due to RSV infection can be prevented using the monoclonal antibody Palivizumab, this is only recommended for use in certain high-risk patients due to its limited cost-effectiveness [12]. As such, for most of the population, there is no primary prevention targeted at RSV infection. However, several RSV vaccines and monoclonal antibodies are currently in clinical development and evaluation [10, 13]. Therefore, understanding the underlying national trends in admissions caused by RSV – particularly bronchiolitis – is crucial in determining potential future vaccine strategy and monitoring the impact of a potential future vaccine.

This study aims to describe bronchiolitis hospital admissions in children under the age of 2 years in Scotland from 2001 to 2016 by admission and patient characteristics. The association between admission rates and socioeconomic deprivation will also be described, to further highlight target populations for preventative measures and interventions.

Methods

Study data

Data for this study were sourced from the national hospital admissions database for Scotland (SMR01), which routinely captures information on all general, acute inpatient and day case admissions to NHS hospitals in Scotland. Data were extracted on calendar week of admission, sex, age (in months for infants up to 12 months, after which age was recorded as age in years), birth month, Scottish Index of Multiple Deprivation (SIMD) quintile and length of hospital stay. Length of

hospital stay was calculated using admission and discharge dates with zero-day admissions being defined as an admission to a ward (either general, acute or day-bed unit) and discharge from hospital on the same calendar date. Accident and Emergency (A&E) presentations which did not result in an admission were not included in the study

SMR01 uses the International Classification of Disease version 10 (ICD-10) codes to record diagnoses. Patients can have one primary diagnosis and up to 6 other diagnoses. The inclusion criteria for subjects were: any diagnosis of bronchiolitis (as either the primary diagnosis or otherwise) as coded under ICD-10 J21; younger than 24 months at admission; admission to any Scottish hospital between the beginning of calendar week 21 in 2001 to calendar week 20 in 2016. Patients who were readmitted to hospital for bronchiolitis on the same day as discharge were classified as one admission.

The 2011 Scottish Index of Multiple Deprivation (SIMD) definition of deprivation was used to classify subjects into deprivation quintiles where 1 indicated the most deprived population and 5 the least deprived. The full SIMD criteria are described in the supplementary material but included factors on health (including low birth weight, emergency stays in hospital, comparative illness factor and standardised mortality ratio), geographic access to services (including average drive and public transport time to GP services) and household crowding [14]. SIMD does not include smoking prevalence, breastfeeding practices, or vaccination rates.

Data analysis

Admissions fitting the inclusion criteria were described by calendar week and year of admission, sex, age, birth month and SIMD. Calendar weeks were defined as ISO weeks. As bronchiolitis admissions follow a seasonal trend, peaking in the winter months, one epidemiological year was defined as the time between the beginning of week 21 of one year and the end of week 20 of the following year (e.g. children admitted between week 21 of 2001 and week 20 of 2002 were categorised into the 2001/02 year).

Admission rate per year and SIMD were calculated using imputed mid-winter populations [15]. Denominator data on the Scottish population were derived from publicly accessible mid-year estimates released by the National Records of Scotland (NRS) which were stratified by sex, age in years and SIMD. Denominator population estimates for SIMD were only available from 2011 onwards [15]. The overall change in admission rate was calculated by comparing rates from the 2015/16 year to the 2001/02 year. Average annual percentage increases in admission rates and 95% confidence intervals (CI) were calculated overall and for each SIMD quintile.

Length of stay (in days from admission to discharge) was calculated for all admissions and compared over each year and by SIMD. Data were cleaned using STATA and analysed using IBM SPSS Statistics 24.

Results

Between 2001 and 2016, there were a total of 43,514 bronchiolitis admissions in children under 2 years old. 59.6% (n=25904) of cases were males (male to female ratio 1.4 [95% CI 1.4-1.4]). Bronchiolitis admission rates increased 2.2-fold (95% CI 1.4-3.6) between 2001/02 to 2015/16 from 17.2 (95% CI 15.9-18.5) to 37.7 (95% CI 37.4-38.1) admission per 1,000 children per year. This equated to a yearly increase in admission rates of 1.3% (95% CI 1.2-1.4) (Figure 1). Changes in admissions rates were not uniform between the 14 health boards, with NHS Ayrshire and Arran having the largest yearly increase of 3.6% (95% CI 3.4-3.9) whilst NHS Grampian had the smallest increase at 0.3% (95% CI 0.2-0.3) (Online only figure 1).

Most admissions were in infants under 3 months of age (12,660/43,514, 29.1%) with those aged 3 to under 6 months, 6 to under 9 months, 9 to under 12 months, and 12+ months, making up 24.9% (10817/43514), 18.6% (2702/4514), 12.4% (1801/43514) and 15.0% (6526/4514) of the overall cohort respectively (Online only table 1). Infants aged 1 month accounted for 12.6% (5464/43514) of

all admissions in children under 2 years old. After age 1 month, the number of admissions decreased with increasing age (Online only figure 2).

On average, admissions peaked in the month of December across the 15 years of study (Online only figure 3). Infants born in the three months leading up to the peak bronchiolitis month – September, October and November – had the highest number of admissions making up 10.6% (3,937/36,988), 11.4% (4,215/36,988), and 11.7% (4,327/36,988) of all admissions in children under 1 year old (Online only figure 3).

Children from the most deprived backgrounds (SIMD quintile 1) contributed the highest proportion of admission at 31.0% (13473/43128) compared to 24.5% of the general population being classified in this quintile where data were available (Online only table 1, Supplementary material). SIMD quintiles 2, 3, 4 and 5 made up 22.0% (9570/43128), 17.1% (7457/43128), 15.9% (6913/43128) and 13.3% (5805/43128) of the overall study cohort and 20.4%, 18.3%, 18.2% and 18.4% of the general population respectively (Online only table 1, Supplementary material). Rates of admission by deprivation could only be calculated for the years 2011/12 to 2015/16, which translated to 42% (18,537/43,662) of the overall cohort. The national average rate of admission across the 5 years was 32.2 admissions per 1,000 children per year (95% CI 31.7-32.6). The most deprived quintile had the highest overall rate of admission at 40.5 per 1,000 children per year (95% CI 39.5-41.5) whilst the least deprived quintile had the lowest rate of admission at 23.0 per 1,000 children per year (95% CI 22.1-23.9) (Figure 2). Over the 5-year period for which admission rates could be calculated, the most deprived quintile had seen the steepest increase in admission rates with an average increase of 4.7% (95% CI 4.6-5.0) per year from an admission rate of 31.5 (95% CI 29.5-33.6) in 2011/12 to 50.3 (95% CI 47.7-52.8) in 2015/16. In comparison, the least deprived quintile had an increase in admission rates of 2.2% (95% CI 2.1-2.3) over the same period from 17.8 (95% CI 16.0-19.5) to 26.9 (95% CI 24.7-29.1) (Figure 2, Online only table 2)

Since 2001/02 to 2015/16, there was a 5.3-fold (95% CI 5.1-5.5) increase in zero-day admissions from 319 to 1,695 admissions with a smaller increase of 2.4-fold (95% CI 2.3-2.4) being seen in 1-day admissions from 442 to 1,068 admissions (Online only figure 4). The proportion of zero-day admissions rose from 18% (319/1,801) to 40% (1,695/4,259) of all admissions from 2001/02 to 2015/16, whilst the proportion of 1-day admissions stayed the same at 25% (442/1801 in 2001/02, 1068/4259 in 2015/16) and the proportion of >1 day decreased from 58% (1040/1801) to 35% (1496/4259) over the same period (Online only figure 4). Trends in the number of zero-day admission by SIMD suggest that across the 15 years, SIMD 1 had seen the largest increase in admissions with an estimated 5.5-fold increase from 102 to 571 cases in 2001/02 to 2015/16 whilst SIMD 5 increased by 3.9 times in the same period (50 to 195 cases) (Online only figures 5a-c).

Discussion

Between 2001 to 2016, the rate of bronchiolitis hospital admissions in Scotland rose 2.2-fold (95% CI 1.4-3.6) from 17.2 (95% CI 15.9 – 18.5) to 37.7 (95% CI 37.4 – 38.1) admissions per 1,000 children per year in children under 2 years old. The high increase appears to have been primarily attributed to an increase in short stay admissions. Almost a third of admissions in the cohort were in infants aged 3 months old or less, with a peak in 1-month-old infants. Seasonality of bronchiolitis admissions was consistent across the 15 years of study with December being the peak admission month and infants born within the preceding three months most likely to be admitted. The highest admission rates were amongst the most deprived patients, who also accounted for the highest proportion of zero-day admissions.

This study reports an average yearly increase in bronchiolitis hospital admissions of 1.3% (95% CI 1.2 – 1.4, 95% CI) for children under 2 years old with an overall increase in admission rate of 2.2-fold (95% CI 1.4-3.6) across the 15 years. Trends in admission were not the same across health boards, which may reflect differing characteristics such as population density, resource allocation and referral practices (whereby smaller boards are more likely to send patients to larger secondary or

tertiary care centres in another region) [16]. Prevalence of prematurity and low birth weight, key risk factors for bronchiolitis, has been relatively stable in Scotland during the study period [17, 18]. However, general paediatric emergency admissions rates for the same age group have increased during the study period by 3.1% per year [3]. This increase corresponds with English data showing a rise in bronchiolitis admission in children under 2 years of 1.6-1.8% per year between 2004 and 2011 and 5.2% per year between 2011 to 2016 [2, 5]. Global trends in bronchiolitis admission rates vary greatly, however, with data from Portugal and Spain reporting increases over time, Australia reporting relatively stable rates, and the US reporting decreasing trends, these variations are likely to reflect differences in health policies and healthcare systems [4, 19-22].

Our study suggests that the increase in admissions was largely driven by a 5.3-fold (95% CI 5.1-5.5) increase of zero-day admissions, reflecting a wider UK trend in increasing zero-day admissions over the past two decades [3, 23-25]. The Scottish Intercollegiate Guidelines Network (SIGN) updated diagnostic criteria for bronchiolitis (whereby a lower requirement of pulse oximeter was required for admission) in 2015, and is therefore unlikely to have impacted our results [26]. Factors contributing to an increase in bronchiolitis admissions may be similar to the wider factors contributing to a general increase in all-cause paediatric admissions in Scotland: day care attendance at a younger age increasing early exposure to pathogens, changes in parental expectations of treatment, and the decrease in availability of out-of-hours primary care due to changes in general practice (GP) contracts [3, 25, 27]. Coupled with increased pressures on emergency departments to see patients within 4-hours and the focus on routine laboratory testing and oxygen saturation monitoring, this may explain the increase in short-stay admissions [3, 25, 28, 29]. Although we did not directly measure clinical outcomes, such as ICU admission or use of additional oxygen supplementation, the relatively unchanged number of >1-day admissions across the 15-years does not suggest an increase in disease severity over the study period.

Our study suggests that the risk for hospital admission was highest for children under the age of 3 months and especially 1 month old infants, with data from England corroborating this finding [30]. As RSV has been estimated to cause 78% of bronchiolitis cases in children under 5 years old [1, 4, 31], and there are a number of potential vaccine candidates in development, a universal RSV immunization scheme could potentially significantly reduce the burden of bronchiolitis in secondary care [1, 6, 8, 32]. We found that bronchiolitis admissions were highest in children born in the months preceding the RSV season, which is in line with other studies in the UK and temperate countries [8, 33, 34]. Cost-effectiveness models based on English data suggesting the most cost-effective RSV vaccine strategy would target infants born between the months of August to January [8]. Therefore, a similar approach could potentially be adopted for Scotland.

The consistently higher rate of admissions in the least deprived SIMD quintile is consistent with recent studies showing a strong correlation between deprivation in both general paediatric acute lower respiratory tract infections and emergency admissions [3, 4]. A recent study reported a 1.3 (95% CI 1.2 to 1.4) incidence risk ratio for hospitalisation between the most and least deprived deciles for bronchiolitis in infants <1-year-old in Scotland [4]. Our study found that over 15 years there was a larger increase in the number of zero-day admissions in the most deprived quintile compared to the least deprived quintile (5.6-fold increase vs 3.9-fold increase, respectively). These results are also in line with wider Scottish and English admission trends, with data on general paediatric emergency admissions suggesting an 80% difference in admission rates between quintiles in 2013 [3, 6, 23, 24]. These differences may be partly explained by the distribution of bronchiolitis risk factors, such as having a household member who smokes, low birth weight and lack of exclusive breast feeding. A Scotland-wide survey in 2010 suggested 65% of babies in the most deprived quintile had received some form of breast-milk, during their first 12 weeks of life, compared with 86% in the least deprived group [18, 35-37]. Data revision in 2017 showed little change in breastfeeding habits in the least deprived group, but in the most deprived group breastfeeding had risen by 5% [38]. The Scottish Government's Growing Up in Scotland (GUS) cohort study and ISD data

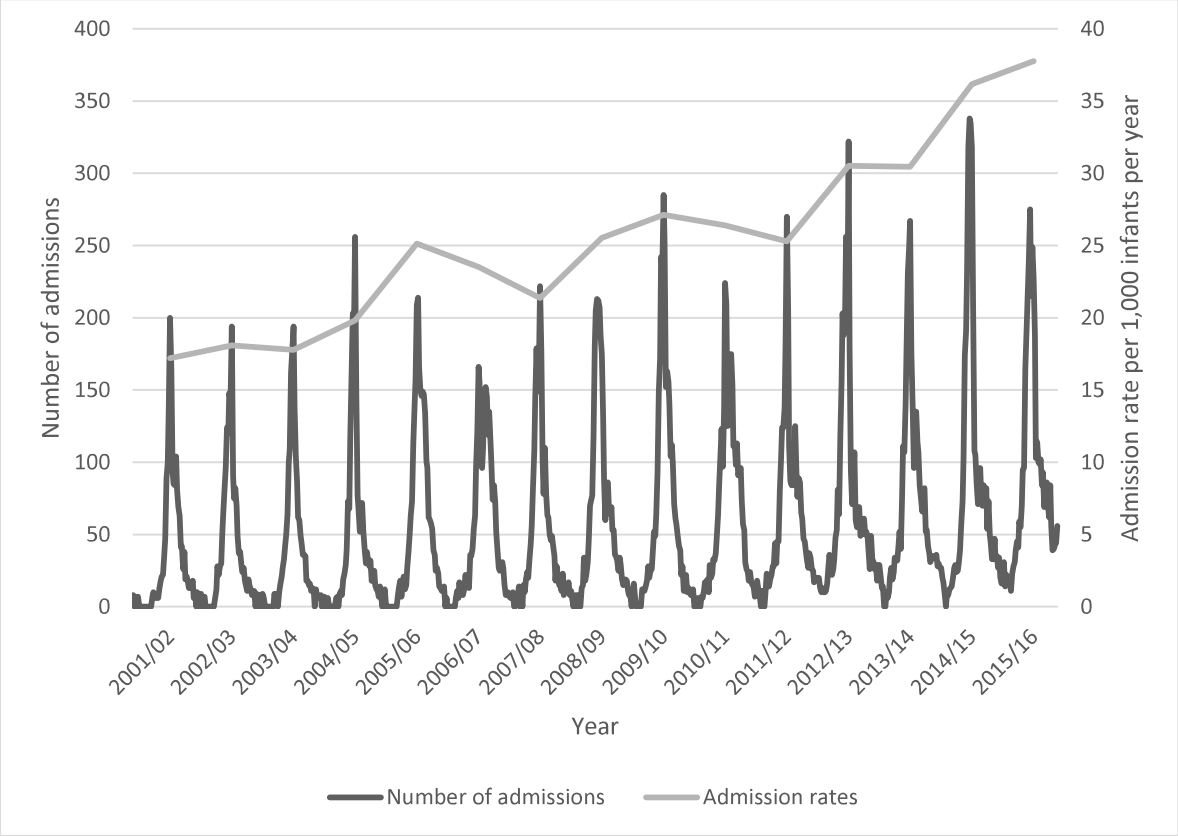
found that infants in the most deprived quintile had a 43% risk of being exposed to maternal or household smoking during pregnancy compared with only 9% in the least deprived quintile [17, 18]. However, this data also reports that nation-wide maternal smoking has fallen from 20.2% in 2007 to 14.0% in 2016 and suggests the largest fall has been in the most deprived quintile. As such, although these risk factors have a significant role in bronchiolitis infections and maintaining the inequality gap, other factors are likely to be driving the increase over time [38]. Areas for further consideration may include the impact of general childhood poverty, which has been increasing since 2010 and currently affects 18% of the UK population, and housing conditions including household overcrowding [39].

The main strength of this study was the ability to track disease trends across a large population over 15 years using routine hospital data, with collection methods and diagnostic criteria seeing little change over this period. This was the first study in Scotland which investigates the trends in bronchiolitis admissions over time in such detail, including considering the correlation between deprivation and trends in admission lengths [3, 4, 11, 40]. However, there were limitations to this study. SMR01 uses retrospectively collected data meaning the quality of collected information was dependent on the quality of physician reports and diagnostic coding. Our extract was not linked to maternal/birth records, therefore we did not assess comorbidities or prematurity as they are likely underreported in SMR01 [41]. In addition, this study did not look at readmissions unless readmission was on the same day as discharge. Lastly, as this dataset was limited to hospital inpatient admissions only, emergency department visits and the primary care burden could not be analysed.

In summary, this study has demonstrated a significant increase in bronchiolitis admissions in Scotland over time, particularly in the most deprived populations, largely driven by an increase in zero-day admissions. Future studies could investigate the main drivers behind the increase in zero-day admissions, and how these could potentially be prevented. As the greatest rise in admissions has been in the most deprived quintile, interventions should be more strongly targeted to this

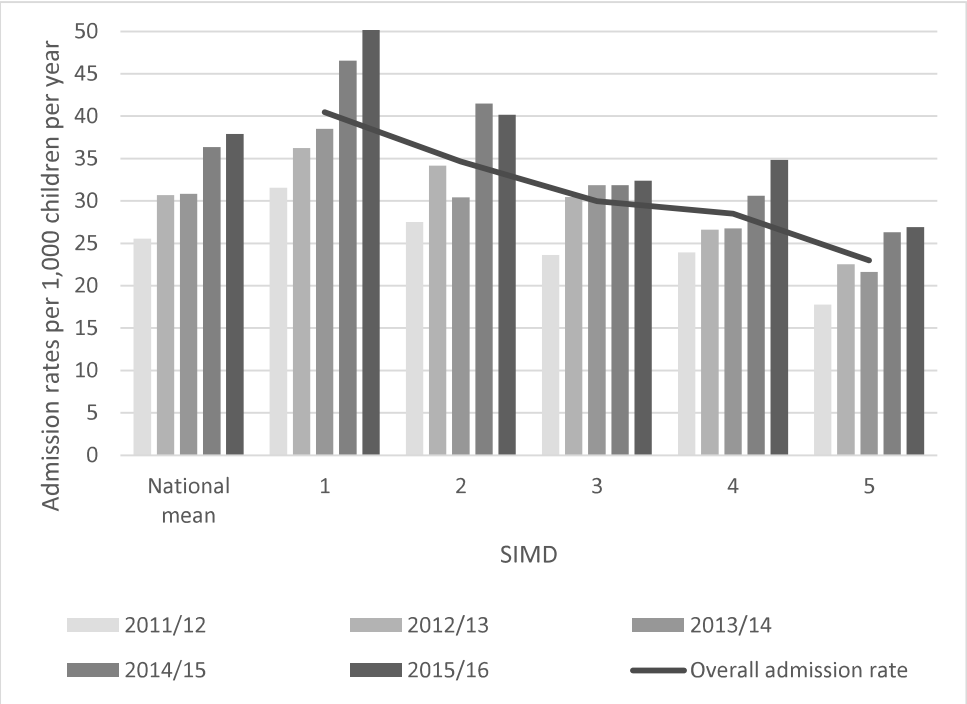
population. This could include increasing accessibility of primary care and home care services, as well as further targeting of prevention strategies such as smoking cessation programmes and the promotion of breastfeeding practices [3, 18, 23]. This study provides detailed baseline epidemiological data to aid policy makers on the strategic planning of preventative interventions and has added weight to the argument for the introduction of a routine RSV immunisation programme.

Figures and tables



THE NUMBER OF ADMISSION PER CALENDAR WEEK WERE PLOTTED ACROSS EACH YEAR. THE PEAKS REPRESENT THE LARGEST NUMBER OF ADMISSIONS IN EACH BRONCHIOLITIS YEAR. RATES PER 1,000 CHILDREN PER YEAR

FIGURE 1: TEMPORAL TRENDS IN BRONCHIOLITIS ADMISSIONS IN SCOTLAND FROM 2001/02 TO 2015/16 (INCLUDING 95% CONFIDENCE INTERVALS)



MOST DEPRIVED QUINTILE = 1. LEAST DEPRIVED QUINTILE = 5. RATES PER 1,000 CHILDREN

FIGURE 2: BRONCHIOLITIS ADMISSION RATES BY SIMD FOR THE YEARS 2011/12 TO 2015/16 WITH AN ADDITIONAL PARAMETER SHOWING THE OVERALL ADMISSION RATES FOR THE YEARS 2011/12 TO 2015/16

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Conflicts of Interest Statement

Dr. CAMPBELL reports grants from INNOVATIVE MEDICINES INITIATIVE, during the conduct of the study; grants, personal fees and non-financial support from WORLD HEALTH ORGANIZATION, grants and personal fees from SANOFI, grants from BILL AND MELINDA GATES FOUNDATION, grants from UK NIHR, outside the submitted work. Dr. NAIR reports grants from INNOVATIVE MEDICINES

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Respiratory Syncytial Virus Consortium in Europe investigators

Rachel M Reeves, You Li, Harry Campbell, Harish Nair (The University of Edinburgh, Scotland); Maarten van Wijhe, Thea Kølsen Fischer, Lone Simonsen, Ramona Trebbien (Statens Serum Institut, Denmark); Sabine Tong, Mathieu Bangert, Clarisse Demont (Sanofi Pasteur); Toni Lehtonen (Finnish Institute for Health and Welfare, Turku University Hospital, Finland); Terho Heikkinen (Turku University Hospital, Finland); Anne Teirlinck, Michiel van Boven, Wim van der Hoek, Nicoline van der Maas, Adam Meijer (National Institute for Public Health and the Environment (RIVM), Netherlands); Liliana Vazquez Fernandez, Håkon Bøas, Terese Bekkevold, Elmira Flem (Norwegian Institute of Public Health, Norway); Luca Stona, Irene Speltra, Carlo Giaquinto (Penta, Italy); Arnaud Cheret (Janssen); Amanda Leach, Sonia Stoszek (GlaxoSmithKline); Philippe Beutels (University of Antwerp, Belgium); Louis Bont (The University Medical Centre Utrecht, Netherlands); Andrew Pollard (University of Oxford, England); Peter Openshaw (Imperial College, England); Michael Abram (AstraZeneca); Kena Swanson (Pfizer); Brian Rosen (Novovax, Rockville, Maryland, United States); Eva Molero (Synapse Research Management Partners S.L).

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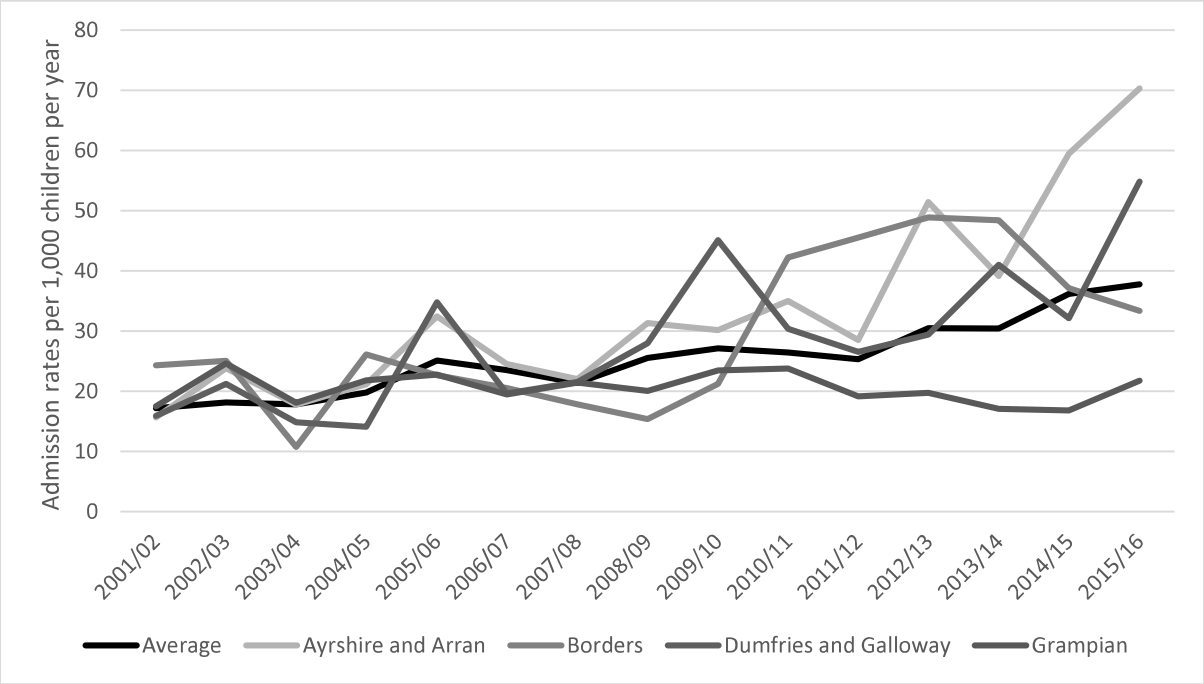
Trends in hospital admissions for bronchiolitis in Scotland, 2001-2016: a national retrospective observational study – Online only and supplementary material

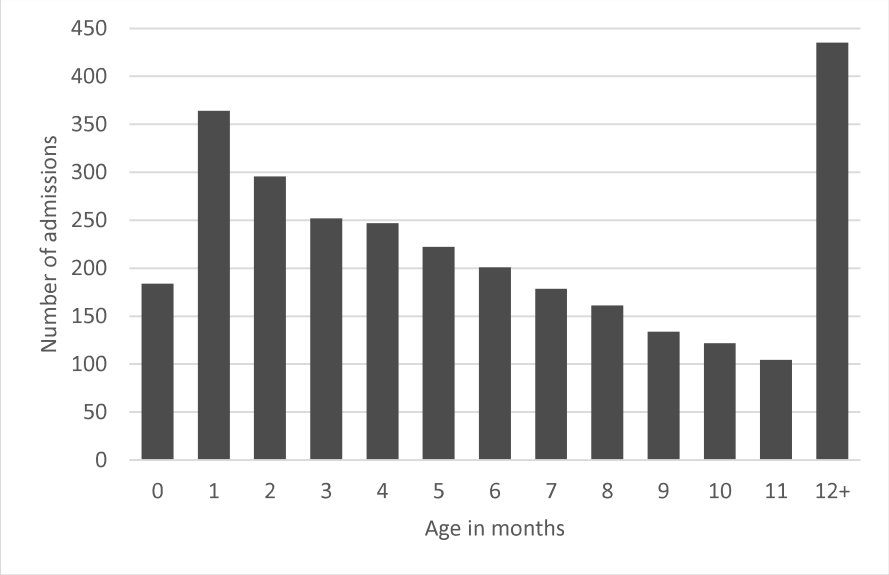
Online only



ONLINE ONLY FIGURE 1: ADMISSION RATES BY NHS HEALTH BOARD COMPARING THE BOARDS WITH THE LARGEST AND SMALLEST INCREASES IN ADMISSION RATES ACROSS THE STUDY PERIOD

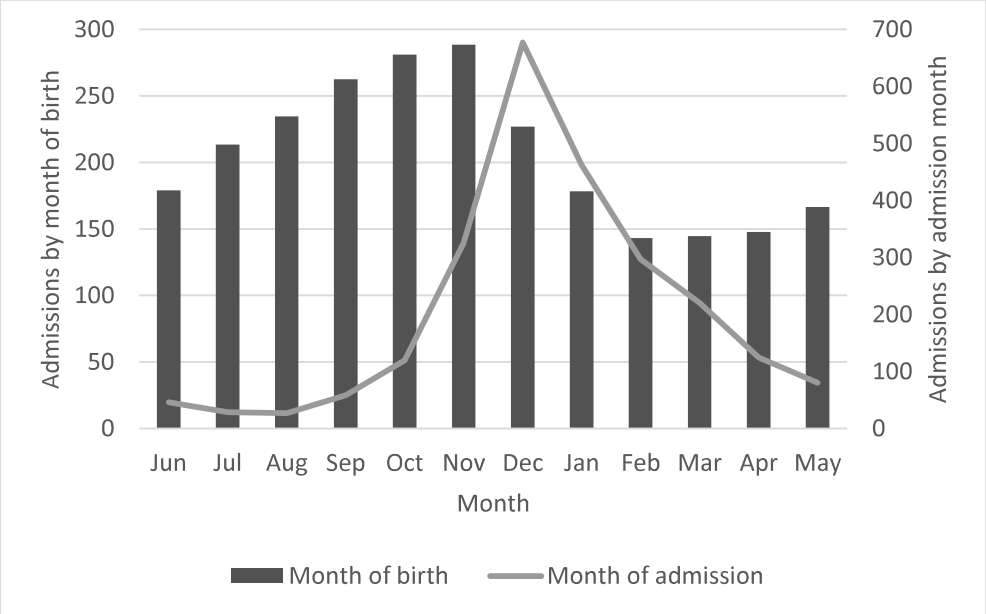
ONLINE ONLY TABLE 1: DESCRIPTIVE SUMMARY OF STUDY SUBJECTS

		Total admissions		
		N	**Per year**	**%**
Total number of cases		43,514	2,901	-
Sex	Male	25,904	1,727	59.5%
	Female	17,609	1,174	40.5%
	M:F ratio	1.47	-	-
Age groups	0 to< 3m	12,660	844	29.1%
	3 to < 6m	10,817	721	24.9%
	6 to < 9m	8,107	540	18.6%
	9 to <12m	5,404	360	12.4%
	12m+	6,526	435	15.0%
SIMD	1.00	13,473	898	31.0%
	2.00	9,570	638	22.0%
	3.00	7,457	497	17.1%
	4.00	6,913	461	15.9%
	5.00	5,805	387	13.3%
	Missing	296	-	0.7%



CHILDREN BETWEEN 12-23 MONTHS OF AGE WERE CLASSIFIED TOGETHER AS 12+

ONLINE ONLY FIGURE 2: ANNUAL NUMBER OF BRONCHIOLITIS ADMISSIONS CAPTURED ACROSS THE 15 YEARS OF THIS STUDY BY AGE IN MONTH



THIS GRAPHIC SHOWS THE RELATIONSHIP BETWEEN BIRTH MONTH (BAR GRAPH) AND ADMISSION MONTH (LINE GRAPH) FOR INFANTS UNDER 1 YEAR OF AGE

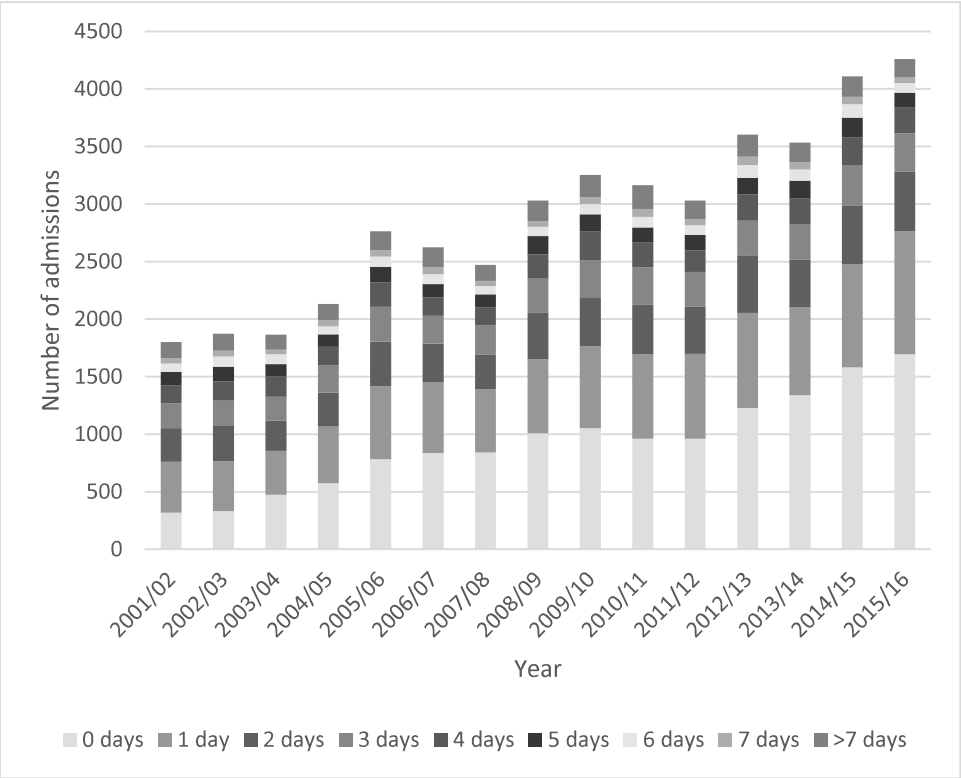
ONLINE ONLY FIGURE 3: ANNUAL NUMBER OF ADMISSIONS BY MONTH OF BIRTH IN RELATION TO THE TOTAL NUMBER OF ADMISSIONS BY MONTH OF ADMISSION FOR INFANTS UNDER 12 MONTHS

ONLINE ONLY TABLE 2: AVERAGE RATE OF CHANGE PER YEAR FROM 2011/12 TO 2015/16 FOR EACH SIMD QUINTILE AND THE DIFFERENCE IN ADMISSION RATES BETWEEN THE MOST DEPRIVED (QUINTILE 1) AND LEAST DEPRIVED (QUINTILE 5) POPULATIONS PER YEAR

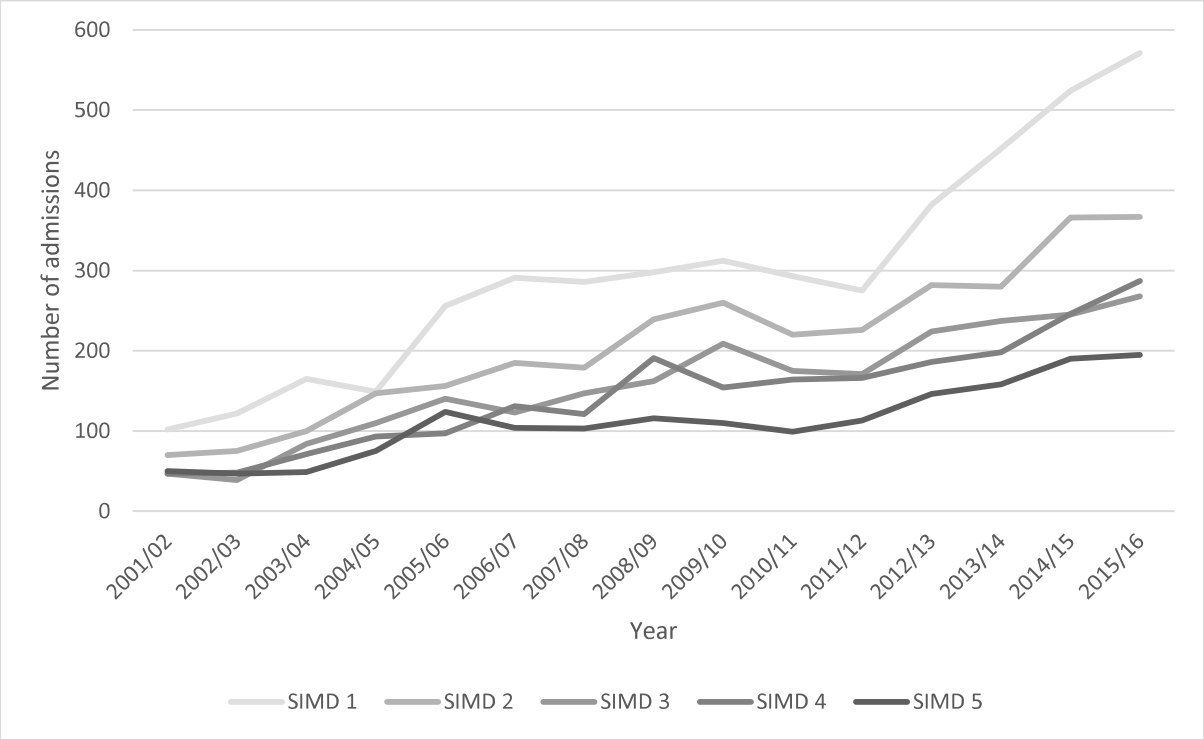
	Change in rate (%)	**95% CI**	
National average	3.03	2.89 -	3.17
1	4.78	4.57 -	5.00
2	3.26	3.09 -	3.43
3	1.89	1.79 -	1.99
4	2.58	2.46 -	2.70
5	2.21	2.10 -	2.31

Differences in admission rates

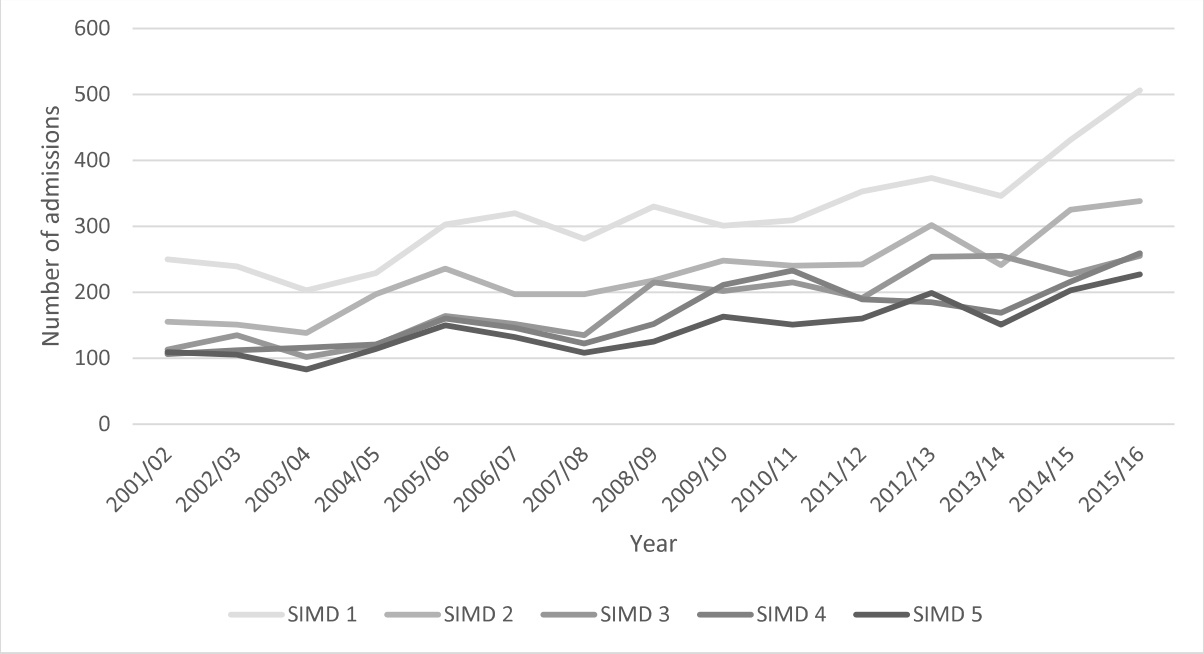
	2011/12	**2012/13**	**2013/14**	**2014/15**	**2015/16**
Absolute difference	13.8	13.7	16.9	20.2	23.4
Percentage difference	78%	61%	78%	77%	87%



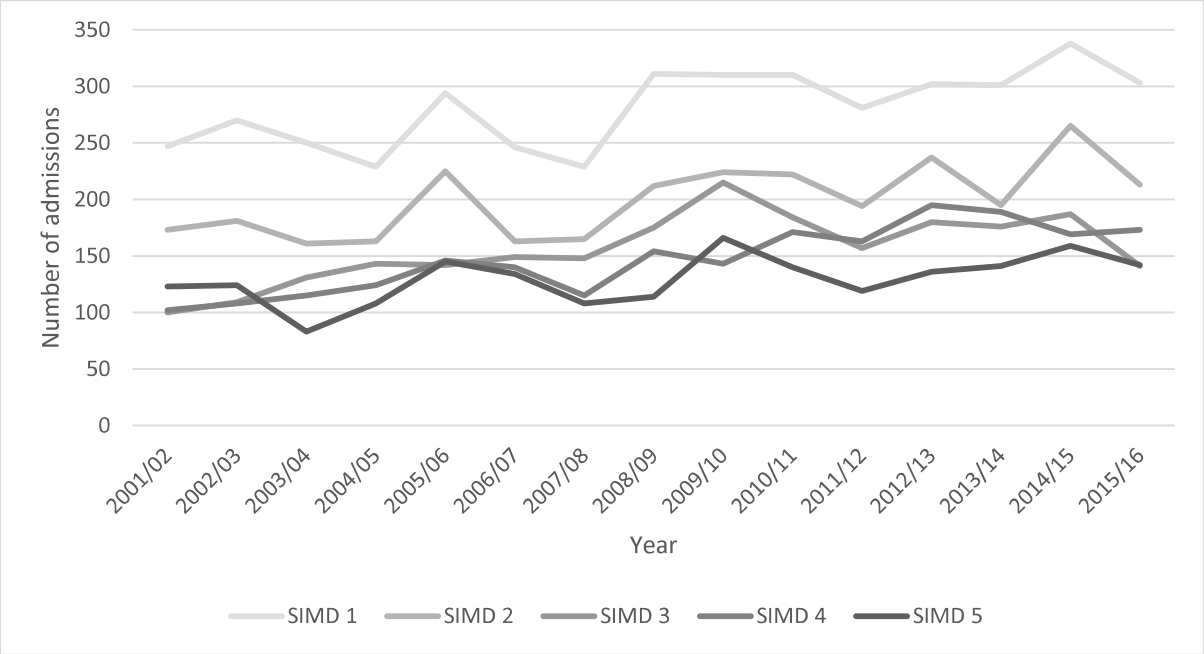
ONLINE ONLY FIGURE 4: TEMPORAL TRENDS IN THE NUMBER OF BRONCHIOLITIS ADMISSIONS BY LENGTH OF STAY



ONLINE ONLY FIGURE 5A: NUMBER OF ZERO-DAY ADMISSION BY SIMD BY YEAR



ONLINE ONLY FIGURE 5B: NUMBER OF ADMISSIONS LASTING ONE OR TWO DAYS BY SIMD BY YEAR



ONLINE ONLY FIGURE 5C: NUMBER OF ADMISSIONS LASTING THREE OR MORE DAYS BY SIMD BY YEAR

Supplementary material

SIMD domains and indicators

SUPPLEMENTARY TABLE 1: A BREAK DOWN THE OF 7 SCOTTISH INDEX OF MULTIPLE DEPRIVATION INDICATORS AND THEIR DOMAINS AS DEFINED BY THE SCOTTISH GOVERNMENT [GOVERNMENT OF SCOTLAND 2018]

INDICATOR	DOMAIN
INCOME	• Percentage and count of people who are income deprived
EMPLOYMENT	• Percentage and count of working age people who are employment deprived
HEALTH	• Comparative Illness Factor as standardised ratio • Hospitalisations due to alcohol misuse as standardised ratio • Hospitalisations due to drug misuse as standardised ratio • Standard mortality ratio • Emergency stays in hospital as standardised ratio • Proportion of the population being prescribed antidepressant, antipsychotic or drugs for anxiety • Proportion of live singleton births of low birth weight
ACCESS	• Average drive time to amenities in minutes (petrol station, GP surgery, post office, primary school, secondary school and retail centres) • Public transport travel times to amenities in minutes (GP surgery, post office, retail centres)
EDUCATION	• Percentage of school pupil attendance • Attainment score of school leavers • Working age people with no qualifications as standardised ratio • Proportion of 16-19 year olds not in full-time education, employment or training • Proportion of 17-21 year olds entering into full time higher education

CRIME	• Number and rate out of 10,000 population of recorded crimes for offences relation to violence, sexual offence, domestic housebreaking, vandalism, drug offences and common assault
HOUSING	• Percentage and count of people living in house-holds which are overcrowded • Percentage and count of people living in house-holds with no central heating

ICD-10 codes used in this study

SUPPLEMENTARY TABLE 2: DESCRIPTION OF THE INTERNATIONAL CLASSIFICATION OF DISEASES VERSION 10 CODES USED IN THIS DATASET [WORLD HEALTH ORGANISATION ICD-10 2018]

ICD-10 code	Description
Bronchiolitis (J21)	• J21.0 - Acute bronchiolitis due to respiratory syncytial virus • J21.1 - Acute bronchiolitis due to human metapneumovirus • J21.8 - Acute bronchiolitis due to other specified organisms • J21.9 - Acute bronchiolitis, unspecified Bronchiolitis (acute)

Population estimates of SIMD from 2011 to 2016

ABSOLUTE NUMBER AND PROPORTION OF CHILDREN AGED <2 YEARS PER SIMD PER YEAR IN THE GENERAL POPULATION OF SCOTLAND

SIMD	2011/12 (%)	2012/13 (%)	2013/14 (%)	2014/15 (%)	2015/16 (%)
1	28821 (24.3)	29157 (24.8)	28546 (24.9)	27777 (24.6)	27434 (24.4)
2	24074 (20.3)	24032 (20.5)	23521 (20.5)	23048 (20.4)	22863 (20.3)
3	21963 (18.5)	21601 (18.4)	20965 (18.3)	20690 (18.3)	20499 (18.2)
4	21660 (18.3)	21274 (18.1)	20781 (18.1)	20625 (18.2)	20639 (18.4)
5	22072 (18.6)	21339 (18.2)	20809 (18.2)	20985 (18.6)	20956 (18.6)
TOTAL	118589	117402	114621	113123	112390